

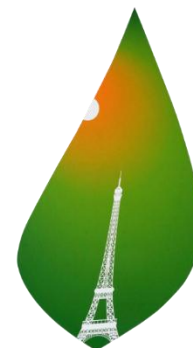
## Solution Team

Values and Benefits of Forest Products

## LCTPi Forests and Forest Products as Carbon Sinks

## The Role of the Bioeconomy in Climate Change Mitigation

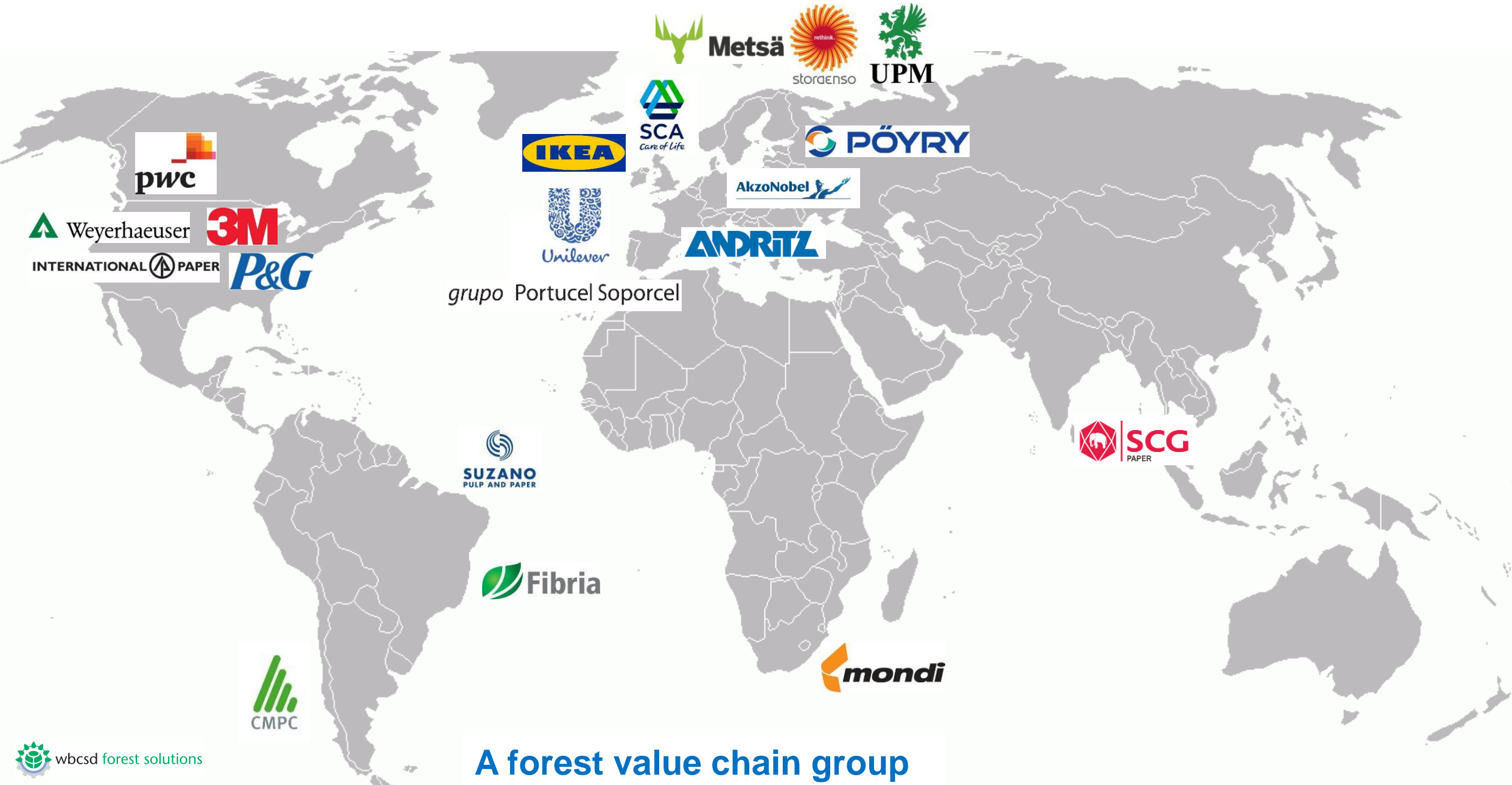
European Parliament, Brussels, September 29, 2015



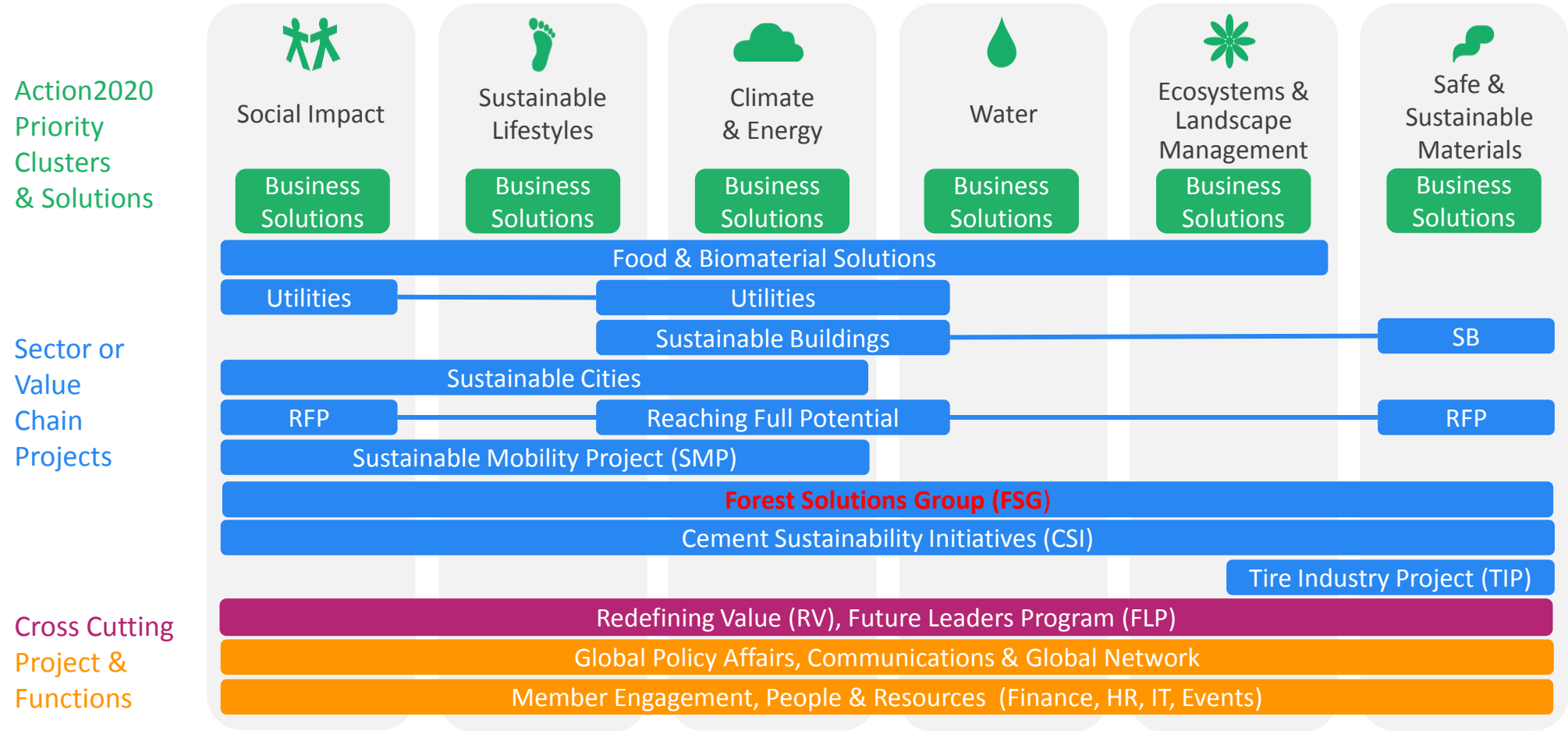
**PARIS2015**  
UN CLIMATE CHANGE CONFERENCE  
COP21•CMP11



# Forest Solutions Group



# WBCSD: Forest Solutions Group



# Low Carbon Technology Partnerships Initiative (LCTPi)

This initiative was launched at COP20 in Lima by the WBCSD with Sustainable Development Solutions Network (SDSN) and the International Energy Agency (IEA). It is one of the flagship initiatives of the French Presidency of COP21.

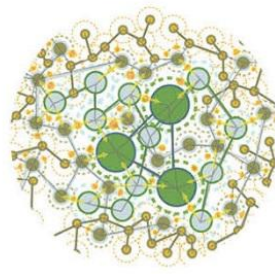
WBCSD's Action2020 Business Solutions, SDSN's Deep Decarbonisation Pathways and IEA's Technology Roadmaps come together to achieve two objectives:

- 1) **Accelerate the diffusion of existing technologies** by removing technological, market and social barriers and introducing required policy and financial instruments
- 2) **Develop Public Private Partnerships (PPPs)** on the Research, Development, Demonstration and Deployment (RDD&D) of potentially game changing **new technologies**



Renewables

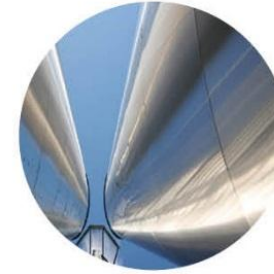
● Solar ● Wind ● Hydro



Smart Grids



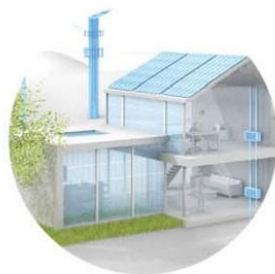
Advanced Liquid  
Biofuels



Carbon Capture  
& Storage



Materials



Energy Efficiency  
in Buildings



Low-Carbon  
Mobility



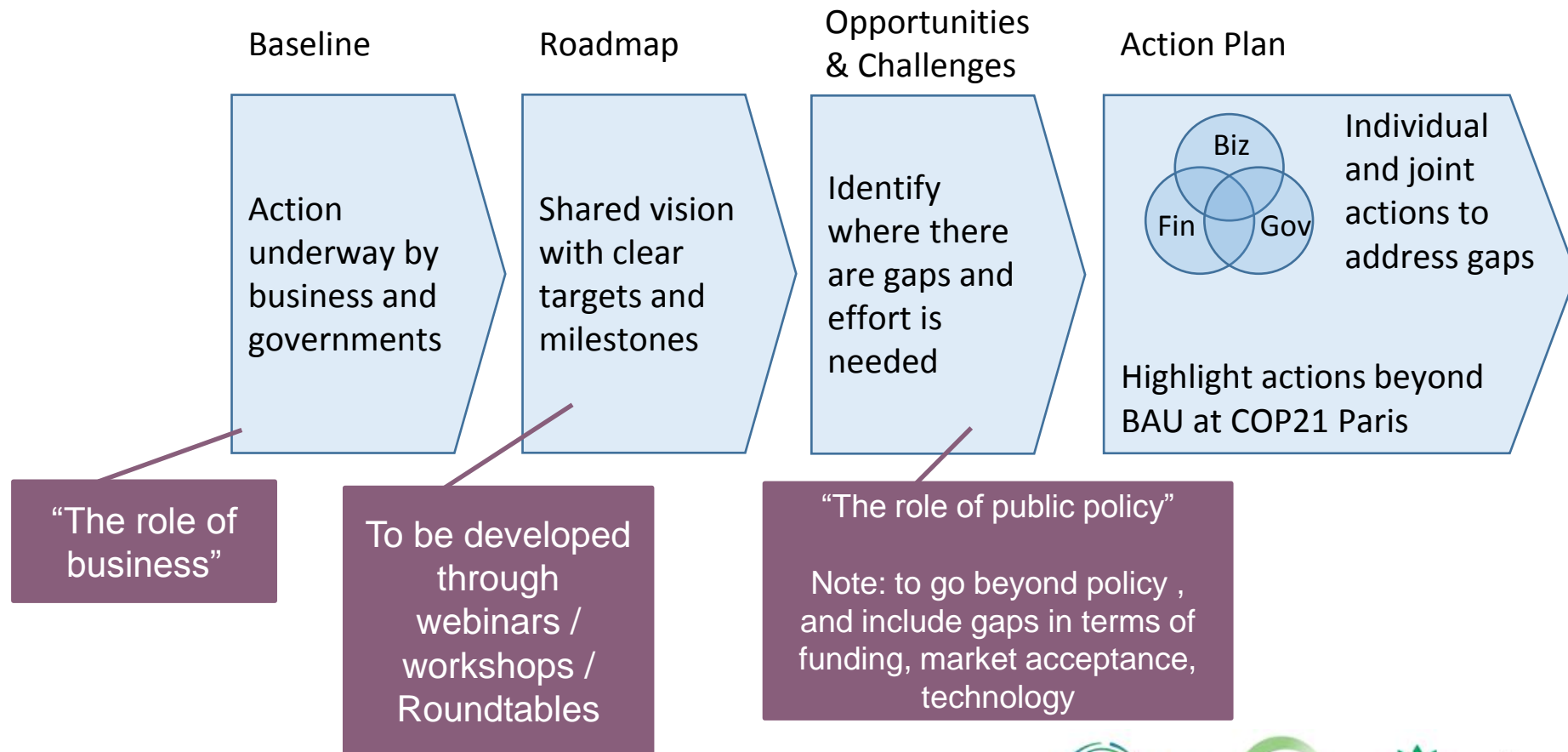
Forests & Forest Products  
as Carbon Sinks



Climate Smart  
Agriculture

Strong links between the two on the bio-economy, land use and landscape approaches.

# The LCTPi Process



# The Ambition Statement

Replacing more energy intensive products with wood based products and scaling up sustainable forest management is the most efficient way to mitigate climate change. Therefore we will:

- Stabilize forest cover by 2030 and restore forest cover to 1990 levels by 2050
- Meet the global demand for forest products by doubling output from sustainably managed and production forests by 2030 and tripling output by 2050
- Fast track bioeconomy development through sector collaboration and value chain partnerships to deliver innovative bioproducts and breakthrough technologies to reduce GHG emissions in manufacturing

# Clustered Business Solutions

## Forests and Forest Products as Carbon Sinks Business Solutions

The Forest Solutions Group of the WBCSD seeks to develop sector-wide solutions that align with global agreements and can be deployed at scale and at relatively low cost when compared to the cost of abatement and mitigation in other sectors.

These are clustered into three main areas of focus referencing SDGs and the New York Declaration on Forests.

### Sustainable Forest Management

The vision for sustainably managed forests is aligned with the IPCC supply-side mitigation options and potential for the AFOLU sector presented in its Fifth Assessment Report (AR5). This vision is also aligned with SDG 15 and 13 and the commitments made by signatories to the New York Declaration on Forests. The LCTPi will support the mitigation objectives of the WBCSD Climate Smart Agriculture group in relation to agriculture-driven deforestation and degradation.

### Breakthrough Technologies

The pulp and paper sector is energy intensive while being a relatively low greenhouse gas emissions source due to the use of biomass for energy generation. New breakthrough technologies in pulp and paper processes have the potential to dramatically reduce energy consumption and make more available emissions free energy to the grid or to other emissions intensive industrial processes. This approach is aligned with SDG 8 and 13.

### Forest Products and the Bioeconomy

The FSG has documented and quantified a range of measures, business practices and initiatives that would support the growth of the bioeconomy from sustainably managed forests. The vision is to triple forest production from planted forests by 2050 in order to sustainably meet the demand for forest products. SDGs 8, 12, 13 and 15.



# Focus Action Areas – Forests and Forest Products as Carbon Sinks

## Sustainable Forest Management

- Increase planted forest area by 60% focusing on non-forested land and degraded forestland
- Reduce harvesting on 5 million ha/yr in modified natural forests (e.g. less fuel wood harvesting from degraded forests)
- Reduce deforestation by 5 million ha/yr in line with the New York Declaration on Forests
- Promote sustainable fiber sourcing to ensure fiber production from sustainably managed forests

## Breakthrough Technologies

- Deep eutectic solvents (DES) - A chemical process by which biomass can be dissolved into lignin, cellulose and hemicellulose using minimal energy
- Flash condensing - Using steam to blast dry fibers into a forming zone using very little water
- Supercritical CO<sub>2</sub> - Drying pulp and paper without the need for heat and steam

## Forest Products Bio-economy

- Public sector and private sector procurement to fast track bio-economy development
- Liquid biofuels as a drop in replacement for diesel in heavy vehicles
- Solid biofuels in biomass to energy plants and co-firing operations
- Forest products as carbon sinks and substitutes for emissions intensive materials, especially in construction

# Bioeconomy enabling conditions

- The fundamental basis for the bioeconomy must be from sustainably managed forests
- Carbon neutral biomass is a key requirement for the sector to flourish
- Public sector procurement and private sector procurement: biopreferred policies (USDA case study)
- Value chain partnerships and cross-sectoral approaches – construction, liquid transport fuels, plastic composites
- PPPs to fast-track and scale up the bioeconomy

# Bioeconomy and LCTPi Engagement

LCTPi Bioeconomy Science Technology and Innovation Forum

October 13

10.30-15.30

SCA Stockholm

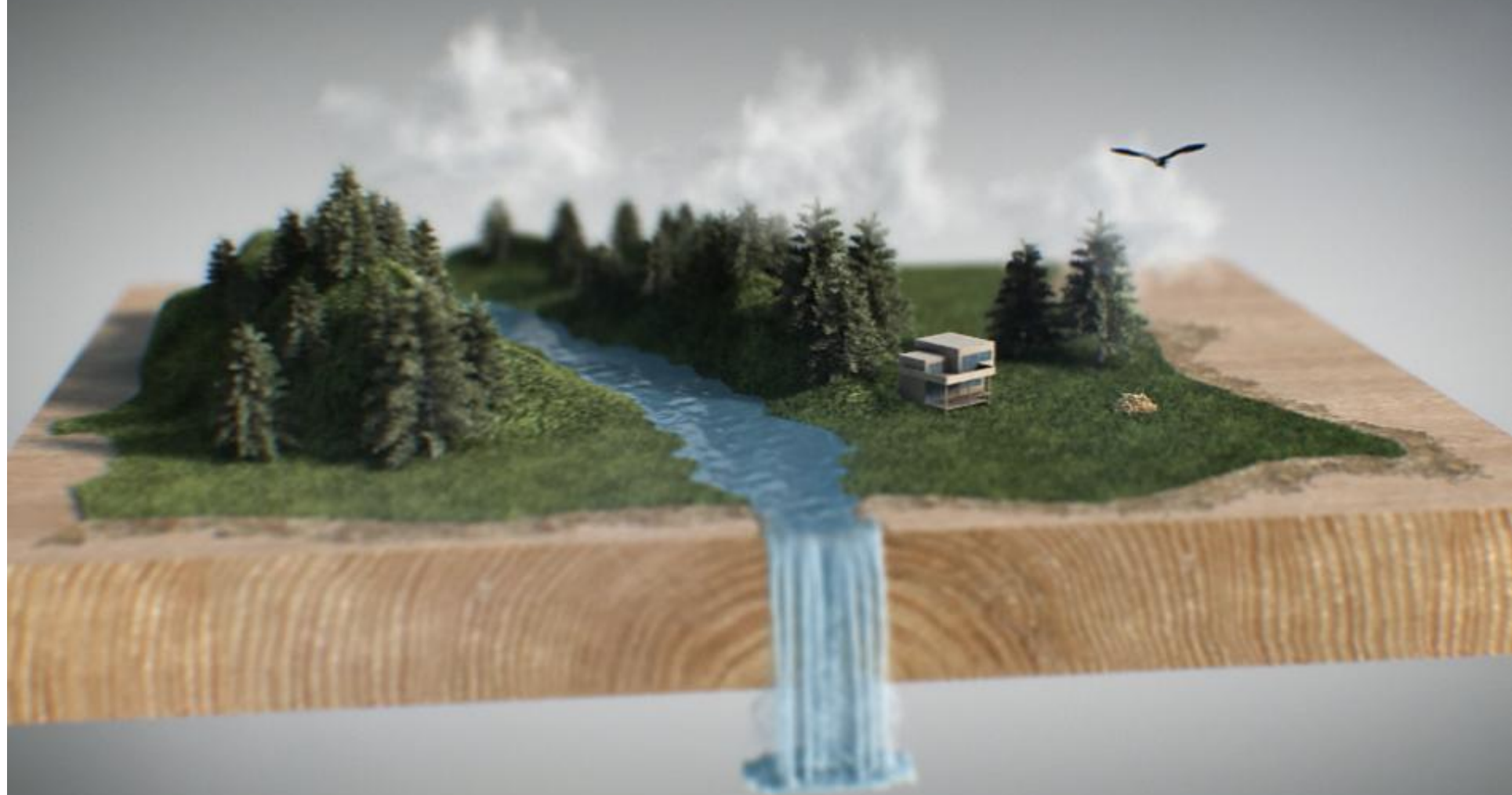
Facilitated by McKinsey and Co



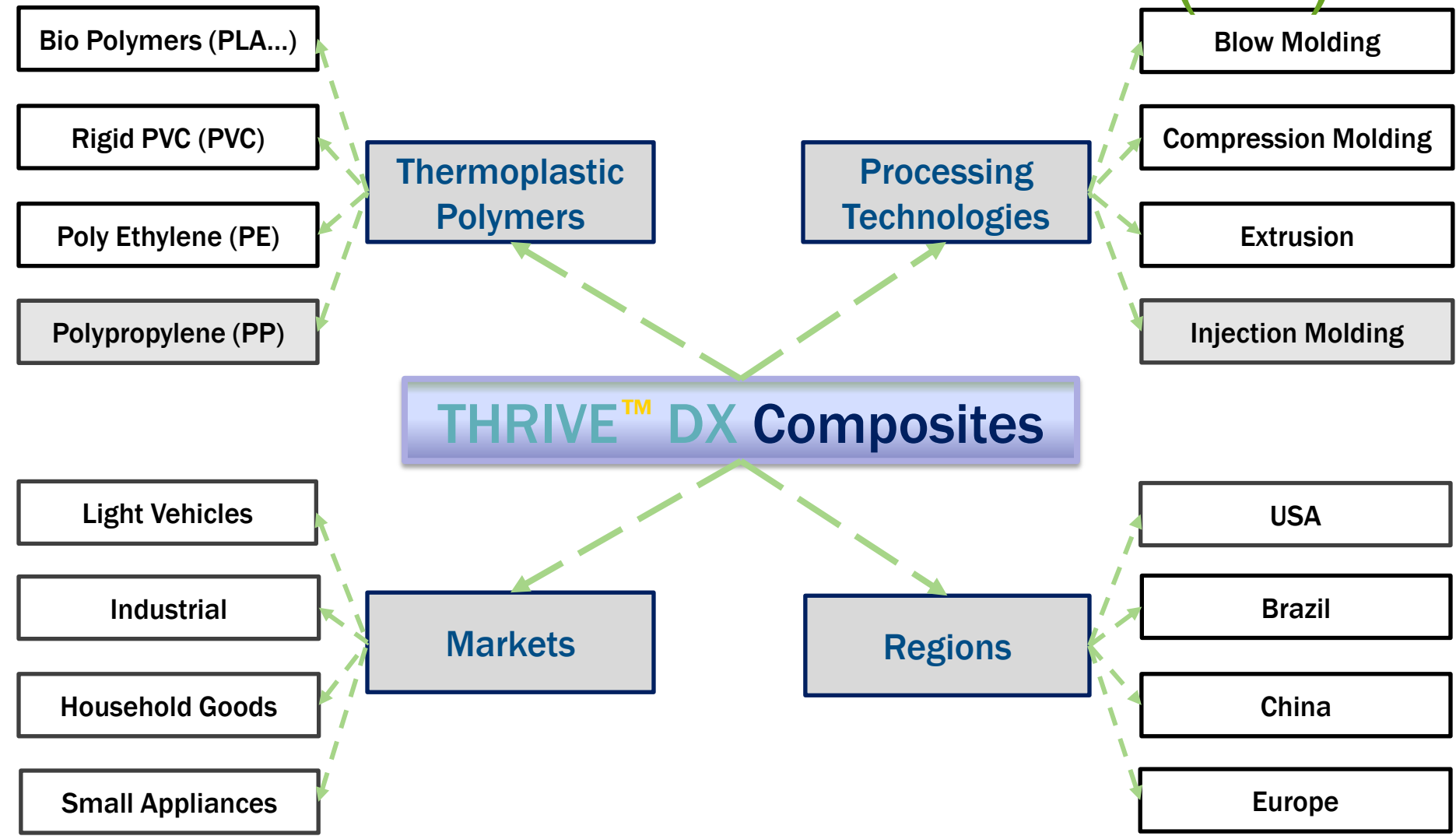
# THRIVE Case Study

European Parliament, September 29, 2015

# From Trees to THRIVE



# 1<sup>ST</sup> PLATFORM TECHNOLOGY FOR CELLULOSE FIBERS (CF)



# ENERGY AND WEIGHT SAVINGS

End-Product	Alternative Material	Moulding Cycle Time Savings	Weight Savings	Potential GHG life cycle savings
Automotive Material	Glass-filled Polypropylene	26%	6%	19% (6.8 kg CO2/kg product; 3.3 kg Co2/kg in production, 3.5 kg CO2/kg in use)
Industrial Bracket	ABS (acrylonitrile butadiene styrene)	43%	11%	
Office Furniture Leg End Cap	HIPS (high-impact polystyrene)	53%	13%	
Industrial Pump housing assembly	Glass-filled nylon	66%	26%	

# THRIVE Benefits

- Reinforcing fiber is “green/sustainable”
- Passes auto interior odor tests
- Rapid molding at significantly lower cycle times
- Lighter weight parts versus most composites
- The bigger the part, the greater the energy savings
- Minimizes surface sink and internal voids
- Bonds easily to plastic and elastomeric materials
- Reduced mass = stronger parts using less material



# SUCCESS!!

- 2014 SPE's Auto Innovation Awards – Environmental Category Winner



**Environmental**

**SPE INNOVATION AWARDS COMPETITION & GALA**  
HONORING THE BEST IN AUTOMOTIVE PLASTICS

**Cellulose Fiber Composite Console Armrest**

**OEM/Vehicle**  
Ford Motor Co.  
2013 Lincoln MKX luxury CUV

**System Supplier**  
Johnson Controls, Inc.

**Material Processor**  
Johnson Controls, Inc.

**Material Supplier**  
Weyerhaeuser NR Co.

**Resin**  
Thrive 20DX235 PP



This application represents the first time glass fiber-reinforced PP has been replaced by a natural fiber-reinforced PP with equivalent performance but improved environmental impact. This armrest console uses 20% renewably sourced cellulose fiber obtained from sustainably harvested forestry by-products. The resulting part is cost neutral but 6% lighter, reduces tool abrasion, and lowers process energy 10% thanks to lower temperature and faster process cycles. From a lifecycle analysis standpoint, it reduces CO<sub>2</sub> emissions by 11% and saves 2,500 gal of fuel over the vehicle's life.



# THRIVE: Challenges

- Internal:
  - Polymer market: entirely new market/customers for CF
  - R&D: limited knowledge of composite formulations
  - Sales force: not well equipped to serve the polymer market
    - No footprint in the polymer market or speak “plastics language”
    - Selling composite pellets not pulp
  - Manufacturing: full dispersion of cellulose fibers in the polymer matrix
  - Purchasing power: limited (e.g. raw materials)
  - Management of expectations

# THRIVE: Challenges

- External:
  - Displacing “well established materials” that have been in the market for > 30 years
  - THRIVE is a new class of composites – reaching target markets quickly and effectively
    - Risk disequilibrium: understand market risk that THRIVE creates for its customers (e.g. automotive)
    - Complex value chain: how to engage and navigate it
    - Understand time to market differences between markets



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